

## ABSTRACT

Presented are methods and apparatus for controlling the processing of a substrate during a process step that is sensitive to one or more process conditions. One  
5 embodiment includes a method performed with corresponding apparatus that includes a controller. One step includes constructing a perturbation model relating changes in control parameters for the apparatus to one or more resulting changes in the process. The method also includes the step of using the perturbation model with at least one of a  
10 performance objective and a constraint to derive optimized control parameters for the controller. Another step in the method includes operating the controller with the optimized control parameters. Another embodiment includes an apparatus for processing substrates where the apparatus comprises optimized control parameters.